

1. A simultaneous electrochemical assay comprising a substrate having a plurality of analyte binding areas, each of said analyte binding areas adapted to bind a different specific analyte; and a plurality of working electrodes each working electrode adjacent to one analyte binding area and separated from the nearest adjacent analyte binding area by a distance effective to permit a measurement by each electrode of analyte bound to its adjacent analyte binding site and not measure an interfering amount of analyte bound to said nearest adjacent analyte binding site.

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- Sub A*
2. The assay claimed in claim 1 wherein said binding sites comprise a plurality of different analyte specific proteins.
3. The assay claimed in claim 1 wherein said binding sites each comprise a different antigen.
- 5 4. The assay claimed in claim 1 wherein each binding site comprises a different antibody.
5. The assay claimed in claim 1 further comprising at least one auxiliary electrode.

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6. A method of testing for a plurality of different analytes in a test solution using a test cell having a plurality of spaced analyte binding sites wherein each binding site is specific for a separate analyte; locating separate electrodes adjacent to each binding site and spaced from an adjacent binding site;
- 5 adding a test solution to said cell;
- adding reagent to said cell wherein portions of said reagent react with each of said analytes and wherein said reagent includes at least one label
- 10 electrochemically detecting said label at each of said electrodes in less than a time in which label-produced product at any binding site can migrate to an adjacent binding site.

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7. The method claimed in claim 6 wherein said label contains an enzyme and further comprising adding substrate to said cell wherein said label is detected by measuring a reaction product of said enzyme and said substrate.

5 8. The method claimed in claim 7 wherein said product is measured amperometrically.

9. The method claimed in claim 6 wherein said binding site comprises a plurality of analyte specific proteins and said reagent comprises a plurality of analyte specific proteins each labeled with the
10 same label.

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